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Please find below and/or attached an Office communication concerning this application or proceeding.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/539,781
Filing Date: September 20, 2005
Appellant(s): FRENZEL ET AL.

Mark Farley
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 08/12/2010 appealing from the Office action mailed 12/18/2009

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1, 2, 4-19 and 21-28 .

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being

maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

US 6,656,287 Sanders 12-2003

Christoph Schultheiss et al. **"Processing of Sugar Beets With Pulsed-Electric Fields"** *IEEE Transactions on Plasma Science*, Vol 30, No.4, Agust 2002. page 1547-1551.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

I do not see where steps (b) and (c) of claim 1 are specifically addressed.

I am returning the case to you.(From Anthony)

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claim 1, 2, 6-12, 15, 16, 18, 19, 21, 27, 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanders (US6,656,287) in view Schultheiss("Processing of Sugar Beets with Pulsed-Electric fields. IEEE Transactions on Plasma Science, Vol. 30, No.4, Aug 2002).

3. Regarding claim 1 Sanders discloses a process to produce sugar from plant materials such as sugar beets by alkaline treatment with lime to raise the pH up to 12.5pH (called pre-liming step) to enable certain non-sucrose substances contained in juices to decompose and to reach their respective iso-electric point. The process of alkaline treatment of Sanders (Similar as step b and d) can be added to, replace or modify conventional methods and apparatus used to process sucrose containing liquids with the advantage of using less lime or other bases for the purpose of clarify or purify the juice that is commonly practiced .(Col 8, line 45-50). And in various conventional juice process systems, it may be desirable to first utilized base to raise the pH of juice prior to a subsequent process step. (Col 3, ln 50-60, col 4, ln 3-18). Sanders does not specify using electroporation. Schultheiss on the other hand, teaches a conventional juice process using electroporation for the production of nourishment from food plants, such as sugar beets which are pretreated in the electroporation chamber (Similar as step a) to open the vacuoles of the cells by electrical pulse treatment, so the juices can be extracted at lower temperature and minimum processings, resulting in appreciable energy savings, less water and lower process temperature. Schultheiss further emphasizes that it is "preferable to treat entire beets" (page 1550 under factory scaling) which means "the biological material remains substantially unaltered in its form and

character"(similar as the limitation of step b). Both do not specify low mechanical loading. However, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Schultheiss of electroporation for sugar beets (meet the limitation of step a) in an un-altered physical shapes (meet the limitation of step b) with the teaching of Sanders of alkaline treatment (meet the limitation of step b and c) to achieve better extraction yields at lower temperatures, and minimum processing with savings costs by minimizing the use of extracted solvents which have to be either evaporated, treated or recycled and less energy as all the juices have been separated earlier at low temperature. (Schultheiss pg 1547-1549 and Sanders Col.3 ,ln.45-49). The alkalinity treatment of Sanders (step b and c) can be done at anytime, in this case it is used after diffusion (equivalent to step b of the claim) and it is applied to the extracted liquid which still has solid particles, flocculants which may be subjected to subsequent process steps (equivalent to step C of the instant claim) (Col4, line28-30). And from the teachings anyone with ordinary skill in the art can apply the alkalinity treatment to the liquid or to the solids separated from the first step to further extraction of the juices. As biological material can be a solid as well as a liquid and the alkaline treatment can be applied either to the juice or the materials as discussed by applicant in paragraph 26 of the applicant's specification.

4. Regarding claim 2, Sanders in view of Schultheiss teaches a method as claim 1, wherein the biological material in step (a) is subjected to a high voltage field in a conductive medium (Schultheiss : " *High voltage pulses with amplitudes of up to 300kV were created with the help of a six-stage low impedance Marx generator")*

5. Regarding claim 6. Sanders in view of Schultheiss disclose a method as claim 1 wherein, in step (b), the separation step wherein the biological material is supplied with at least one auxiliary substance, (Sanders, col,3, ln45-65," it may be desirable to first utilize base to raise the pH at the separation phase")

6. Regarding Claim 7, Sanders disclose a method as claim 1, wherein step (c) is carried out at a temperature of from 0-65C. (Sanders, Col.4, ln,38-40," *the clarification and purification or refining is undertaken at a temperature of between about 30 degrees Centigrade to about 40 degrees Centigrade" and Schultheiss "below 70C" on page 1549).*

7. Regarding claim 8. Sanders in view of Schultheiss disclose a method as claim 1, wherein the biological material comprises at least one of sugar beet and sugar beet chips. (Schultheiss:" *The standard procedure of sugar production from beets consists of carving the fruits into cossettes and subsequently extracting the juice from these cossettes..").*

8. Regarding claim 9. Sanders in view of Schultheiss disclose a method as claim 1 wherein the biological material comprises chicory. (Sanders :" *the diffusion process, the milling process, other processes that remove juice from plant material, or bring plant juice into aqueous solution, result in a juice containing sucrose, non-sucrose substances and water...may include all manner of plant derived substances and non-plant derived substances...Col 2, line 3-12))*. It would have been obvious for one of ordinary skill in the art at the time of the invention to include chicory as it is also a plant material wherein the juice is found to be useful for health.

9. Regarding claim 10 and 11. Sander in view of Schultheiss discloses a device for isolating ingredients from biological material according to the method as claim1, said device comprising one appliance for electroporation, one full screw extractor arranged between the appliance for the electroporation and the extractor. (Schultheiss, pg 1548.

"Experimental apparatus"). Wherein the full screw is designed as a conveyor screw and wherein a first section of the screw which is designed for receiving the material is formed at a lower point, and a second section of the screw which is designed for receiving the material is formed at an upper point, of a gradient which exist between said first and said second sections,. (Schultheiss. Fig1, 2). The inlet of the screw conveyor is at the low end and the discharge end is at the other end of the screw in an inclined position to save space and to feed the extractor hopper.

10. Regarding claim 12. Sanders teach to use lime to adjust the pH during purification of the juice, i.e. the lime has to be metered to the extract. (Sanders, col 3, ln,52) and it would be obvious that a metering device is used for addition.

11. Regarding claim 15, Sanders discloses a method as claimed in claim 6 wherein the auxiliary substance is at least one of lime and milk of lime (Sanders, Col 5, ln, 41-45).

12. Regarding claim 16, See claim 7 above.

13. Regarding claim 18, Sanders disclose a process system to produce sugar from plant materials such as sugar beets by alkaline treatment to raise the pH to 12.5 after diffusion process (called preliming step) to enable certain non-sucrose substances contained in juices to decompose and to reach their respective iso-eletric point. The process of alkaline treatment of Sanders can be added to, replace or modify conventional methods and apparatus with the advantage of using less lime or other base for the purpose of clarifying, disinfecting or purifying the juice that is commonly practiced .(Col 8, line 45-50). And in various conventional juice process systems, it may

be desirable to first utilized base to raise the pH of juice prior to a subsequent process step. (Col 3, ln 50-60, col 4, ln 3-18). Sanders does not specify using electroporation. As the extractant from the first step still has solids materials, flocclulants, the alkalinity treatment that Sanders discloses can be applied to the extracted juices as well as the solids (biological materials) for further extraction. (Col4, line 28-35). Schultheiss on the other hand, teaches a conventional juice process using electroporation (it is a well known process used to the inactivation of bacteria in laboratories) on the large scale for the production of nourishment from food plants, such as sugar beets which can be extracted at lower temperature by electric pulse treatment, resulting in appreciable energy savings by using less water and lower process temperature. Schultheiss further emphasizes that it is "preferable to treat entire beets" (page 1550 under factory scaling) which means "the biological material remains substantially unaltered in its form and character". Both do not specify low mechanical loading. However, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Schultheiss of electroporation for sugar beets at low mechanical pressure with the teaching of Sanders of alkaline treatment to achieve better extraction yields at lower temperatures, and savings in processing costs by minimizing the use of extracted solvents which have to be either evaporated, treated or recycled and less energy. (Schultheiss pg 1547-1549 and Sanders Col.3 ,ln.45-49) .

14. Regarding claim 19. Schultheiss in view of Sanders discloses a method as claim 18 with argument as claim 2 above.

15. Regarding claims 25 and 26. See claim 15 above.

16. Regarding claims 27, 28. see claim 7.

17. **Claims 4, 5, 14, 17 ,21-24** are rejected under 35 USC 103 as unpatentable over Sanders in view of Schultheiss as applied to claim 1, 10 and 18 and further in view of Eugene et al.(EP1257413 or WO0162482 with English machine translation). Both Schultheiss and Sanders do not discuss the details of the feeding screw despite that both do use the screw conveyors for the process of extracting liquids or sugars out of plant materials such as sugar beets. Eugene, on the other hand discloses a method of extraction of liquid from cellular material such as sugar extraction from sugar beet by a combination of a low mechanical pressing (a screw conveyor) at 0.1 MPa and electrical pulse device . (page 2) It would have been obvious for one of ordinary skill in the art at the time of the invention to use the teaching of Eugene of screw conveyor at low mechanical pressure in the method of Schultheiss as modified by Sanders to provide an efficient extracting method with a compact design to save costs in energy and provide better yields of liquid extraction throughput. Eugene discloses that only a moderate pressure, essentially ranging between 1.105 Pa -30Pa and it is unnecessary to use pressures during mechanical pressing. (Page 2) with a screw press. The claimed pressure of 0.5MPa is within the range disclosed therefore encompassed by prior arts.

(10) Response to Argument

There are Four arguments (A,B, C, and D) that will be addressed.

Responses to arguments A and C:

Appellant's invention is a method of isolating ingredients from biological materials via juice extraction process comprising the process of electroporating the biological

materials (that Schultheiss teaches) with the alkaline treatment (that Sanders discloses) to the biological materials before subsequent other steps such as extraction, evaporation etc.. The characteristic of the claimed process is the mild mechanical impact on the materials by means of a low impact perforated screw conveyor used for separating juice and conveying solids.

The key argument is the alkaline treatment of Sanders to the "juice" and not the biological material.

First and foremost, the language of "biological material" does NOT mean exclusively that the material is a SOLID, as "biological material" can also be a liquid, a mixture of liquids and solid as well..

The claims have to be reviewed and validated in light of the specification, therefore if one reads paragraph 8 of the applicant's specification, it says:

"*...the biological material is subjected to an electroporation in a first step (a), the cell juice of the electroporated biological material is separated off in a second step (b),* ***the material*** *obtained from step (b) is subjected to an extraction in a third step (c) and the ingredients are isolated from the cell juice obtained in step (b) and the extract obtained in step (c) in a fourth step (d)*".

From reading these steps, one leads to believe that **the material** obtained from step (b) is the cell juice which is a liquid which is then go thru the extraction step with the ingredients extracted out of the cell juice in step (c). And from fig 1, the schematic figure of the process flow diagram, one can see that the alkaline treatments (shown as item 6) are added to the liquid as well as the solids, especially before separation as taught by Sanders. Therefore the biological material in step (C) of claim 1 is the cell juice and

NOT the biological material. Otherwise, the claim is contradicting with the step described in paragraph 8 and fig 1.

Furthermore, alkaline treatment in juice process is a known process, specially the use of milk of lime or burnt lime (as Sanders discusses) for purification, clarification and disinfecting of the extractants in the process. Sanders discusses that the alkaline treatment can be performed either to raise pH prior to any subsequent process step such as filtration, separation, ion exchange step, Etc...(Sanders, Col 3, line 44-65).

The applicant also discusses in paragraph 26 that the alkalinity can be introduced to the juice (.."*In another variant, the alkalinity is introduced when separating off the cell juice in step (b). In another variant, the alkalinity is introduced immediately prior to carrying out the extraction (step c)".*

Even if Sanders does not clearly teach that electroporated biological material is subjected to alkaline treatment (because he does not teach electroporation) however he does teach that the alkaline treatment can be done at any time such as at separation step..etc. Therefore, it would be obvious for a normal skill in the art at the time of the invention to know that as the process temperature is now below 70C and the now opened and wet vacuoles biological materials (after the electroporation step of Schultheiss) the materials should be treated to alkaline treatment to raise the pH so they are less prompt to bacteria growth as Sanders points out that the alkaline treatment is for clarification, purification and disinfection.

In summary, as claims 1 and 18 pertain to method with process steps, specifically the electroporation treatment of the material prior to subsequent steps, that Schultheiss

already discloses, with the alkaline treatment of the materials, that Sanders already teaches, the invention is obvious under 35 USC 103 (a) with the combining arts as stated.

Responses to Arguments B and D:

Arguments B and D are about the screw conveyor with mechanical pressurization less than 0.5 MPa (or 500,000 Pa) used to convey the cossettes that have been 'opened" up after electroporation. As stated above in the rejection, as Sander's teaching is mainly focusing on the alkaline treatment, the screw conveyor is not discussed specifically as it is a common equipment that anyone in the art would use as a dual purpose for conveying or for pressing to separate the juices from the solids with a perforated trough. Schultheiss shows in fig 1 and fig 2 and mentions a screw conveyor as a means to convey the electroporated cossettes. As his main teaching is electroporation, the details of the screw conveyor are not discussed. However, from the Appellant's only schematic drawing, one would recognize the set up of the screw conveyor is very much similar to Schultheis 's screw conveyor in fig 1 and 2. Eugene teaches method and apparatus of extracting liquid from a cellular material without significant deterioration of the physical or chemical qualities of the treated materials (page 2 , 3rd paragraph) by minimizing pressure of any mechanical pressing to 1.105 Pa and 30.105 Pa, especially a screw conveyor with a perforated bottom trough. (page 2, 9th paragraph). Even if the screw conveyor of Eugene is not a full screw conveyor , however it would be within the skill of anyone in the art to know that from the teaching of Schultheis of electroporation wherein

the cossettes are recommended to be kept as entire beet, and Eugene's teaching of pressure loading of the screw conveyor should be within 1.105 Pa and 30.105 Pa, anyone would choose a common well known full screw conveyor to achieve low pressure impact so the cossettes would not be mashed up further for extraction as most juices have been extracted and separated with electroporation process. The "unaltered form" is the result of the low pressure, and the pressure of the Eugene's screw conveyor is a lot less than the applicant's screw conveyor (30Pa vs 0.5 MPa which is equivalent to 500,000Pa). Due to above disclosed information from Sanders, in view of Schultheis and Eugene, the claims are rejected as obvious under 35 USC 103(a).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/COLETTE NGUYEN/

Examiner, Art Unit 1732

October 28, 2010

/Melvin Curtis Mayes/

Supervisory Patent Examiner, Art Unit 1732

Conferees:

/Melvin Curtis Mayes/

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